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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/603,341	06/25/2003	Matthew O'Donnell	UOM 0274 PUSP	2637

22045 7590 02/05/2007

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EXAMINER	
SHAY, DAVID M	
ART UNIT	PAPER NUMBER
3735	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/05/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/603,341	O'DONNELL, MATTHEW	
	Examiner	Art Unit	
	david shay	3735	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on September 22, 2006.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1,2,4-8,11-15,18-21,23,24,27-29,36 and 40 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1, 2, 4-8, 11-15, 18-21, 23, 24, 27-29, 36, and 40 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on September 22, 2006 has been entered.

With regard to the enablement rejection of claim 5 applicant points to the portion of the disclosure that discusses the imparting of a substantially continuous force. However, applicant has not enablingly taught how to do so. Similarly, claim 28, reciting the structure for producing the uniform is also not enabled. The examiner submits that without the enabling description of the structure for producing a continuous force, the step of applying such a force to the microbubble is similarly not enabled. Similarly, the mention that the microbubble "operates as a high frequency, high precision acoustic source" in the disclosure does not provide the disclosure necessary of the means by which to control and direct the shockwave so it "operates as a high frequency, high precision acoustic source". Thus these arguments are not convincing, and the rejections have been maintained.

With regard to the indefiniteness rejection of claim 5, the manner in which a sinusoidally oscillating force, which passes through zero force as part of its oscillation, is a continuous force is unclear. With regard to claims 7 and 8 et cetera, it is not the recitation of the terms mico-Newtons and nano-Newtons, per se, but the range implied by use of the term "level" in conjunction with these recitations. For example, would a force of 5 GigaNewtons qualify as "a force in the micro-Newton level", since a GigaNewton is merely 10^{19} microNewtons? The amended phrases are still unclear for the same reason. With regard to claim 14, applicant's

comment that nanobubbles are a subset of microbubbles is noted, however, this does not provide any meaningful information regarding the point at which a bubble ceases being a microbubble and is considered a nanobubble.

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "at least one laser pulse also creates at least one acoustic shock wave via LIOB wherein the at least one acoustic shock wave operates as a high frequency, high precision acoustic source" and the "means for measuring the elasticity of the material in contact with the microbubble based on the movement of the microbubble" must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will

be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 5, 20, and 28 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The originally filed disclosure is silent on the manner in which "the ultrasound wave exerts a substantially continuous force at the surface of the microbubble"; the "at least one laser pulse also creates at least one acoustic shock wave via LIOB wherein the at least one acoustic shock wave operates as a high frequency, high precision acoustic source"; and the "means for measuring the elasticity of the material in contact with the microbubble based on the movement of the microbubble".

Claims 3, 5, 7, 8, 11-14, 28, 36, and 42 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 5 and 28 are indefinite as the exact meaning of the term "substantially continuous force" is unclear, as the very nature of acoustic or ultrasonic waves is to exert an undulating force. Claim 7 is indefinite as the exact meaning of the term "a force in the nano-Newton to micro-Newton level" is unclear. Claim 8 is indefinite as the exact meaning of the term "a force in the nano-Newton to micro-Newton level" is unclear. Claim 11 is indefinite, because it is

unclear what further limitation requiring that the "acoustic wave causes the microbubble to move ..." provides when claim 1, from which claim 11 depends, requires that the acoustic wave "displace a central portion of the microbubble". Claims 14 and 36 are indefinite as the exact meaning of the term "nanobubble" and how this differs from a microbubble is unclear.

Claims 1, 2, 4-8, 11, 13-15, 19-21, 23, 24, 27-29, and 36 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by LeClair.

See especially Figures 3-6 and column 6, line 38 to column 9, line 14, wherein the leading edge of the laser pulse will begin to creat a bubble, which the following portion of the pulse will propagate through, and wherein the ultrasound wave generated by the bubble will exert a substantially continuous force over a very small time scale.

Claims 18 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over LeClair. Ozkan et al teaches a method of cell patterning. LeClair teaches manipulating materials using microbubbles. It would have been obvious to the artisan of ordinary skill to employ a femtosecond laser pulse to generate the microbubble of LeClair, since this is not critical; is well within the skill of one having ordinary skill in the art; and provides no unexpected result, and would deposit the energy in the material quickly, thereby minimizing the escape of thermal energy into the surrounding medium, thus producing a device and method such as claimed.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ozkan et al in combination with LeClair. Ozkan et al teaches a method of cell patterning. LeClair teaches manipulating materials using microbubbles. It would have been obvious to the artisan of ordinary skill to employ the microbubble method of LeClair in the patterning of Ozkan et al since the method of LeClair does not require that charges be induces on the items to be patterned,

or to employ patterning in the method of LeClair, since the method of LeClair can be used for any purposes, as taught by LeClair, and in either case to measure the elasticity of the material, since this provides no unexpected result, and is well within the scope of one having ordinary skill in the art, thus producing a device and method such as claimed.

Applicant's arguments with respect to claims 1, 2, 4-8, 11-15, 18-21, 23, 24, 27-19, 36, and 40 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to david shay whose telephone number is (571) 272-4773. The examiner can normally be reached on Tuesday through Friday from 6:30 a.m. to 5:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Marmor, II, can be reached on Monday, Tuesday, Wednesday, Thursday, and Friday. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DAVID M. SHAY
PRIMARY EXAMINER
GROUP 330